

ABSTRACT OF THE DISCLOSURE

A mode locked pulsed laser is constructed to shorten pulse duration by a solid state saturable absorber, such as a glass doped with a quantum-dot material such as PbS. The saturable absorber, used as a passive mode locker, is preferably used in combination with an active mode locker. Once the pulses are at about the saturation level of the absorber, a Q control module maintains the pulse energy at a roughly constant level while the pulse is shortened. When the pulses are sufficiently short, the mode lockers and Q control module are switched out of the cavity, and then the short pulses are amplified. When the pulses reach sufficient energy, the light is switched out of the cavity by a cavity dumper. The cavity dumper, switches, Q control module and active mode locker may use electro-optic crystals to rotate the polarization of the beam.